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III. CLAIM AMENDMENTS

1. (Cancelled).

2. (Currently Amended) A method of monitoring an interferometer, comprising:

coupling a first optical signal into the interferometer and into a wavelength reference element,

detecting a first resulting interference signal being a result of interference of first parts of the first optical signal in the interferometer,

detecting a resulting reference signal of the wavelength reference element, the resulting reference signal being a result of interaction of the first optical signal with the wavelength reference element,

comparing the first resulting interference signal with the resulting reference signal to detect a drift of the interferometer, and

~~The method of claim 1, further comprising the steps of:~~ substantially permanently sweeping a wavelength of the first optical signal up and down.

3. (Currently Amended) The method of ~~claim 1~~claim 2, further comprising ~~the steps of~~: substantially permanently sweeping a wavelength of the first optical signal up and down within a predetermined sweeping range.

4. (Currently Amended) The method of ~~claim 1~~claim 2, further comprising ~~the steps of~~: substantially permanently sweeping a wavelength of the first optical signal up and down within a predetermined sweeping range, and choosing the sweeping range in a way that it covers an absorption feature of the wavelength reference element.

5. (Currently Amended) A method of monitoring an interferometer, comprising:

coupling a first optical signal into the interferometer and into a wavelength reference element,

detecting a first resulting interference signal being a result of interference of parts of the first optical signal in the interferometer,

detecting a resulting reference signal of the wavelength reference element, the resulting reference signal being a result of interaction of the first optical signal with the wavelength reference element,

comparing the first resulting interference signal with the resulting reference signal to detect a drift of the interferometer, and

~~The method of claim 1, further comprising the steps of:~~ locking the first optical signal to an absorption feature of the wavelength reference element.

6. (Currently Amended) The method of ~~claim 1~~claim 2, further comprising ~~the steps of~~:

detecting a second resulting interference signal being a result of interference of second parts of the first optical signal in the interferometer, and

comparing the phase of the first and the second resulting interference signals to evaluate the direction of the drift.

7. (Currently Amended) The method of ~~claim 1~~claim 5, further comprising ~~the steps of~~:

locking the first optical signal to an absorption feature of the wavelength reference element,

coupling a second optical signal into the interferometer and into the wavelength reference element,

detecting ~~a third~~another resulting interference signal being a result of interference of parts of the second optical signal in the interferometer,

locking the second optical signal to a specified position~~, preferably to an extremum,~~ of the ~~third~~another resulting interference signal, and

detecting a change of a beat signal of a superposition of the first and the second optical signal to detect the drift.

8. (Currently Amended) The method of ~~claim 1~~claim 7, further comprising ~~the steps of:~~ providing the first and the second optical signal with substantially the same polarization.

9. (Currently Amended) The method of ~~claim 1~~claim 2, further comprising the steps of: using the detected drift, if any, for stabilizing the interferometer.

10. (Currently Amended) The method of ~~claim 1~~claim 5, further comprising ~~the steps of~~:

coupling a third optical signal into the interferometer and into the wavelength reference element, the third optical signal having a wavelength substantially different from the wavelength of the first optical signal,

detecting a third resulting interference signal being a result of interference of parts of the third optical signal in the interferometer,

locking the third optical signal to an absorption feature of the wavelength reference element, and

comparing the first resulting interference signal with the third resulting interference signal to detect a wavelength dependency of the drift~~, if any~~.

11. (Currently Amended) The method of ~~claim 1~~claim 9, further comprising ~~the steps of:~~ using the detected drift~~, if any,~~ for introducing a variable optical delay corresponding to the drift into the interferometer.

12. (Currently Amended) The method of ~~claim 1~~claim 2, further comprising ~~the steps of:~~

using the detected drift, if any, for evaluating a property of the interferometer or a device under test being part of the interferometer, the property being a dependency of at least one of the following: temperature, pressure, humidity, magnetism, voltage.

13. (Currently Amended) The method of ~~claim 1~~claim 2, further comprising ~~the steps of:~~

coupling a useful optical signal into the interferometer, and

detecting a useful resulting interference signal being a result of interference of parts of the useful optical signal in the interferometer for evaluating a wavelength of the useful optical signal.

14. (Currently Amended) The method of ~~claim 1~~claim 2, further comprising ~~the steps of~~:

coupling a useful optical signal into the interferometer along the same path as the first optical signal and having a substantially orthogonal polarization with respect to a polarization of at least one of the following: the first optical signal, the second optical signal, the third optical signal, and

detecting a useful resulting interference signal being a result of interference of parts of the useful optical signal in the interferometer for evaluating the wavelength of the useful optical signal.

15.-17. (Cancelled)

18. (Currently Amended) An apparatus for monitoring an interferometer, comprising:

a first coupler coupling a first optical signal of a first optical source into the interferometer and into a wavelength reference element,

a first detector detecting a first resulting interference signal being a result of interference of parts of the first optical signal in the interferometer,

a reference detector detecting a resulting reference signal of the wavelength reference element, the resulting reference signal being a result of interaction of the first optical signal with the wavelength reference element,

an evaluating unit comparing the first resulting interference signal with the resulting reference signal to detect a drift of the interferometer, and

~~The apparatus of claim 17, further comprising:~~ a first locking circuit ~~for~~ locking the first optical signal to an absorption feature of the wavelength reference element.

19.-28. (Cancelled)

29. (New) The method of claim 5, further comprising:

detecting a second resulting interference signal being a result of interference of parts of the first optical signal in the interferometer, and

comparing the phase of the first and the second resulting interference signals to evaluate the direction of the drift.

30. (New) The method of claim 5, further comprising using the detected drift, if any, for stabilizing the interferometer.

31. (New) The method of claim 5, further comprising using the detected drift, if any, for evaluating a property of the interferometer or a device under test being part of the interferometer, the property being a dependency of at least one of the following: temperature, pressure, humidity, magnetism, voltage.

32. (New) The method of claim 5, further comprising

coupling a useful optical signal into the interferometer, and

detecting a useful resulting interference signal being a result of interference of parts of the useful optical signal in the interferometer for evaluating a wavelength of the useful optical signal.

33. (New) The method of claim 5, further comprising:

coupling a useful optical signal into the interferometer along the same path as the first optical signal and having a substantially orthogonal polarization with respect to a polarization of at least one of the following: the first optical signal, the second optical signal, the third optical signal, and

detecting a useful resulting interference signal being a result of interference of parts of the useful optical signal in the interferometer for evaluating the wavelength of the useful optical signal.